

## Review

THE GRASSES OF BURMA, CEYLON, INDIA AND PAKISTAN (excluding Bambuseae) by N. L. Bor, Pergamon Press, Oxford, 1960.

pp. 767 with 80 line drawings, indexed. £8 net.

Dr. Bor, who was formerly the Assistant Director of the Royal Botanic Gardens, Kew and before that in the Indian Forest Service where he served for many years in Assam, has produced in this volume a monumental contribution to our knowledge of the grasses not only of the sub-continent of India but of South-east Asia generally, for a substantial number of the grasses named and keyed in this volume occur both to the west as far as Tropical and Sub-tropical Africa and to the East as far as Queensland and Tropical North Australia.

The book consists of 2 parts—a general part dealing with morphology, dispersal, the use of grasses and with obnoxious grasses, and the second part dealing with the detailed systematics. The section on morphology is well balanced and not unexpectedly reaches the general conclusion that in the Gramineae "there exists the most extraordinary mosaic of characters". The homologies of the palea with the prophyllum are carefully worked out and the author accepts the view that the ovary is 3-carpellary. Two unexpected roles for grasses are surely that of *Garnotia arborum* which is an epiphytic in moses on tree trunks or on rocks and *Hubbardia leptoneuron* a true waterfall spray species with leaves as thin as a filmy fern.

Dr. Bor concludes that the great majority of grasslands in India are seral and "fire is the factor which maintains a grassland of tall grasses". Further "if grazing is added to fire the tall grassland is replaced by a grassland of depauperated species". Malayans will note with interest that *Imperata* "is the most aggressive of them all" and that our familiar Siam weed (*Eupatorium odoratum*) "is capable of ousting *Imperata cylindrica*". The lessons to be drawn from the proper management of lawns for the guidance of those developing grazing for animals are not drawn and perhaps this is not surprising when the phenomena of selective grazing are referred to as "choosey". However, Anker-Ladefoged's work in Ceylon indicating a necessity to match the quality of the grazing animal with the quality of the sward is quoted.

The discussion of aromatic species and their oils is valuable, and the increasing use of grasses for the manufacture of coarse papers is noted. The recommendation of *Rhynchelytrum repens* as a "most attractive subject in a garden" evokes a rueful smile as this is a familiar, if attractive, weed in many parts of Malaya.

The chapter on obnoxious grasses is mainly concerned with the well known phenomenon of hydrocyanic acid poisoning following wilting and the troublesome "weeds" exemplified by our all too familiar *Imperata* or Lalang.

In the systematic part, a number of new tribes not used before in describing the flora of India are included. The research from which the origin of many of these new tribes has originated is well exemplified by the exposition of the puzzling position of *Gymnopogon* resulting from the study of its anatomy. It would appear to be neither a member of the *Chlorideae* nor of the *Perotideae*; what then?

This multiplication of tribal names is so considerable that one wonders whether it is not going too far. For example, there are 4 new tribal names in this local flora (howbeit, dealing with an enormous area of the earth's surface) which do not appear in Hubbard's last full account of the grasses in the 2nd edition of Hutchinson's "Families of Flowering Plants" which is little more than a year older. The contrast between the Pooid sub-family with its 36 tribes and the Panicoid sub-family with 3 tribes is most striking. There is no doubt of course that it is easier to give a satisfactory key to 36 tribes in the first instance than to try and key the Pooid group as a whole, though even here the author is forced to give a paragraph of exceptions. The keys are, in fact, the substance of the descriptive portion of this work and it is pleasant to note in almost every case dimensions are expressed as ranges of size rather than absolute figures. The tribes, genera and species are all dealt with in strictly alphabetical order—the species in each genus being listed seriatim; varieties when listed appear under species. The synonymy is carefully presented with full and complete references so that the application of the international rules of nomenclature is explicit. It is always helpful, especially to the non-expert endeavouring to identify a grass, to be able to confirm keying by a careful comparison with a full description. For example, this is possible when using Dr. Stapf's descriptions in the flora of Tropical Africa. Here this can not be attempted. Again, reference to authentic herbarium material is also helpful and one would have liked to see a more generous quotation of exsiccata.

In certain cases Dr. Bor has been bold enough to use names such as e.g. *Sporobolus indicus* auctt. non (Linn.) R. Br. This indicates that "*Sporobolus indicus* (Linn.) R. Br." is a "complex which requires much field study for its resolution", a kind of problem which is familiar not only to agrostologists but to most taxonomic workers. Few botanists have, however, been bold enough to deal with it in this forthright way before. A further innovation at least in volumes dealing with grasses but quite usual for instance when dealing with orchids—is the record of two bigeneric hybrids. These are the well-known artificial hybrid *Euchlaea mertonensis* Janaki and *Elymordeum* which is recorded from Chitral.

The student of evolution will find curious facts:—"the glumes of *Lopholepis ornithocephala* and *Latipes senegalensis* are so fantastic as to defy any rational explanation as to how or why such shapes evolve". In the two species *Panicum elegantissimum* and *Ichnanthus vicinus* "the grain, tightly enclosed between the lemma and palea, appears to turn through 90° when mature so that, instead of facing the lower lemma, it is at right angles to it. This may be of some advantage to the plant, but it is difficult to think what it might be".

There are some odd statements—thus the unnumbered *Bromus macrostachys* "has not so far been found in our area, but it is extremely probable that it will be found in Northwestern Pakistan". Again while as far as possible an illustration for each tribe has been chosen one is puzzled at the choice of *Lygeum spartum* "which may have escaped from a garden" in Kashmir, especially as this has also been chosen amongst others to garnish the dust-cover of the volume.

The book illustrates the taxonomic difficulty of this important family and the impressive way that the taxonomists at the Royal Botanic Gardens, Kew, are progressing with its treatment. It is one of the international series of monographs on pure and applied biology, the Botany Division of which has Dr. R. C. Rollins and Dr. G. Taylor as general editors.

There are remarkably few typographical errors and the paper and binding are of good quality. Nevertheless the price is surely very high?

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